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THE INTERNAL STRUCTURE OF THE STEM AND LEAF OF RUELLIA CILIOSA PURSH., PHLOX OVATA L. AND SPIGELIA MARILANDICA L.

By Theo. Holm.

(With two plates.)

In a previously published paper[1] we have seen that the roots and rhizomes of these plants may be readily distinguished by means of their structure, and especially by the internal. In regard to the vegetative organs above ground, the stem and leaf, these show, also, a very characteristic structure, which is very useful to the separation of these plants, when the determination seems doubtful.

When the flowers are present the plants are easily recognized; in *Spigelia* the flowers are scarlet outside, yellow within, and the clavate tube of the corolla is much longer (about four times) than the lobes; in *Ruellia* the flower is light blue, or very slightly purplish, with a funnelform corolla, while in *Phlox* the corolla is pink and strictly salverform. The outline of the foliage is, also, very distinct, besides the venation. Our *Fig. 1* shows the stem-leaf of *Spigelia; Fig. 2*, that of *Ruellia; Figs. 3* and *4*, a basal and a stem-leaf of *Phlox*. Characteristic of the leaf of *Spigelia* is that most of the lateral nerves proceed from near the base of the blade, while in *Ruellia* the blade is strictly penninerved, and in *Phlox ovata* the lateral nerves are not at all visible in the stem-leaf (*Fig. 4*), and only faintly visible in the basal. The leaves are hairy in all of these plants, but the hairs are very small in *Phlox* and *Spigelia*, and hardly to be detected by the naked eye; in *Ruellia*, on the other hand, the lower face of

[1] This Journal, Vol. 78, 1906, page 553.

the leaf is very hairy, the hairs long and very distinct along the veins especially. A full description of these plants is, moreover, to be found in Gray's Manual and in his Synoptical Flora of North America.

When thus the specimens are complete their identification is very easy; when neither the flowers nor fruits are represented the plants may be identified by means of their leaves and stems, not speaking of the excellent characters furnished by their rhizomes and roots.

A microscopical examination may sometimes be necessary, and in order to facilitate the work we might offer a brief description of the anatomical structure possessed by these plants as an appendix to our paper (l. c.) on their root-structure. Let us first examine the stem.

Ruellia ciliosa Pursh.—In the *Acanthaceæ* the nodes of the stem are usually quite swollen and thicker than the internodes, which is due to a different development of some of the tissues. The internodes are obtusely quadrangular in cross-sections. The cuticle is smooth, and the outer cell walls of epidermis are moderately thickened. Cystolithes are frequent in the epidermis. A collenchymatic tissue of several separate strands is to be observed outside the cortex; this parenchyma, the cortical, is thin-walled and consists of about nine layers with cystolithes and raphides, but without sclerotic cells. A thin-walled endodermis surrounds the stele, which is obtusely quadrangular in transverse section. We find in the stele an almost continuous ring of stereome located between endodermis and the leptome. The mestome-strands are all collateral; the hadrome consists of rather short rays of vessels separated by mostly four rows of thick-walled parenchyma. The central portion of the stele is occupied by a thin-walled pith with many raphides and crystals, but without cystolithes, sclerotic cells and deposits of starch.

In the swollen nodus the collenchyma is developed much stronger, *i. e.*, it constitutes a closed sheath around the cortex; the cells are more thick-walled and there is a larger number of layers. The cortex represents a broader zone in the node than in the internode; furthermore, the stereome inside endodermis is reduced to a few scattered cells. In regard to the pith this is much broader in the node than in the internode.

Phlox ovata L.—The stem is cylindric, glabrous and smooth, and covered by a thick, longitudinally wrinkled cuticle. Epidermis is

very thick-walled, especially the outer walls, and does not contain crystals of any kind. The cortex consists of about ten layers, of which the peripheral, the one that borders on epidermis, is thickened like collenchyma. Endodermis is thin-walled and surrounds a closed sheath of thick-walled stereome in one or two layers. The mestome-bundles are collateral, and the vessels are arranged in long rows with thick-walled medullary rays. The pith is thin-walled, solid and contains no starch.

Spigelia Marilandica L.—In this plant the stem is four-winged, and the wings quite scabrous from short, pointed hairs. The cuticle is wrinkled longitudinally, and epidermis very thick-walled. A collenchyma of several layers is to be observed in the wings, but of only one layer between these, and completely encircling the cortex; the latter consists of about four layers with chlorophyll and starch. The stele is here supported by a few strata of heavily thickened stereome in an almost uninterrupted zone. Very characteristic are the bicollateral mestome strands, in which the leptome is distributed on the outer and inner face of the hadromatic rays. The vessels are narrow, about ten in each row, and the medullary rays consist only of one layer between each two of the hadromatic rays.

If we compare now the stem-structure of our three plants, it seems as if this may be sufficient to the distinguishing of *Spigelia* from both *Phlox* and *Ruellia*. The four-winged stem and the bicollateral mestome-strands are characters that are possessed by *Spigelia* in contrast to the quadrangular stem of *Ruellia* with cystolithes, and the cylindric stem of *Phlox* destitute of crystals and with simply collateral mestome-bundles. That the stem-leaves of these same plants offer equally distinct peculiarities may be seen from the following notes:

Ruellia ciliosa Pursh.—On the leaf-blade the cuticle is thin and smooth; epidermis is slightly thickened (the outer wall) and viewed "en face" (*Fig. 10*) the lateral cell-walls show prominent undulations, and on both faces. Stomata occur only on the lower face, and they have one pair of subsidiary cells which are vertical on the stoma (*Fig. 10*). Large cystolithes abound in epidermis on both faces, and two kinds of hairs were observed: small, almost sessile glandular (*Fig. 11*), which are scattered over both faces of the leaf, and some long, pluricellular, pointed, which are very frequent along the nerves, especially on the lower face. The chloren-

chyma is differentiated into a palisade-tissue (*P* in *Fig. 8*) and a pneumatic, more open tissue underneath this (P^1 in the same figure). The chlorenchyma is interrupted by collenchyma and by a thin-walled water-storage tissue, which follows the stronger veins and which is especially well developed on the dorsal face of the blade. The mestome-strands are collateral, and the mediane, which is the thickest, is composed of several strands united so as to form a broad arch with the concave face turned upwards. While the lateral nerves possess distinct and completely closed parenchyma-sheaths, the midrib shows merely an open sheath covering the leptome side of the mestome strands, but not the hadrome.

Phlox ovata L.—The thick cuticle is smooth on the lower, but wrinkled on the upper surface of the leaf, showing striations in all directions around the stomata; where it covers the hairs (*Fig. 13*) it shows very distinct spiral ridges. The stomata, which are confined to the dorsal face of the blade, have no subsidiary cells, but are surrounded by mostly three ordinary epidermis cells. The outer cell-wall of epidermis is very thick, especially on the lower face. Small wart-like projections of epidermis (*Fig. 14*) abound along the margins of the leaf, but besides these there are also some short, pluricellular hairs (*Fig. 13*) scattered over both faces and along the margins, but they are very minute; glandular hairs (*Fig. 15*) consisting of a unicellular, globose head borne on a short stalk of three to four cells in a single row, occur above the broad midvein, but they do not seem to be very numerous.

In regard to the chlorenchyma we find, also, here a distinct bifacial structure, there being two layers of typical palisades and about five strata of very irregular cells with wide intercellular spaces representing a pneumatic tissue. The leaf has no stereome, but a [illegible] collenchyma accompany the midrib, which is, moreover, [illegible] by several broad layers of thin-walled water-storage tissue. The midvein shows the same outline as in *Ruellia*, but has a closed parenchymatic sheath all around; the lateral veins are very thin and are directly embedded in the chlorenchyma.

Spigelia Marilandica L.—The leaf is much thicker than in the two other plants, and the veins much more prominent on the dorsal face. The cuticle shows striations, but these are not so distinct as in *Phlox ovata*. Epidermis is moderately thickwalled and bears

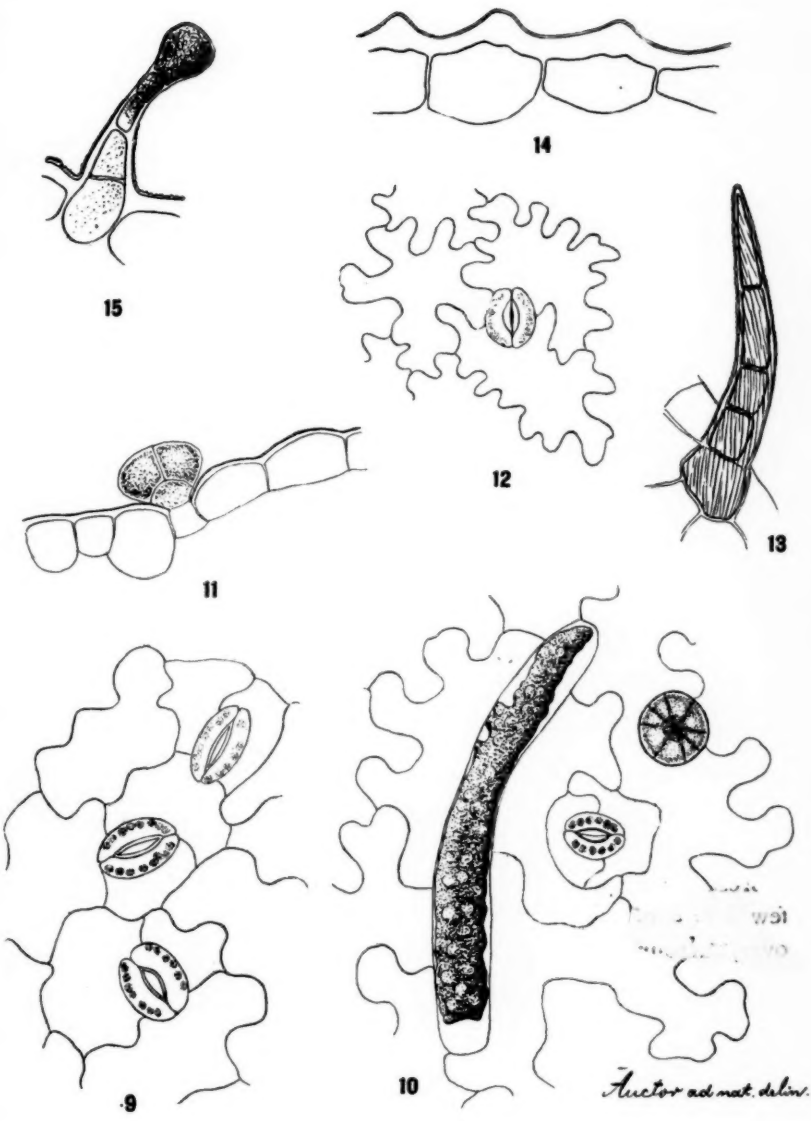

PLATE 2.

many short hairs (*Figs. 5* and *6*) along the margins and along the veins, on the dorsal face especially. Viewed "en face" the lateral cell-walls of epidermis are undulate on both sides of the leaf, but the undulations are not so pronounced as in *Ruellia* and *Phlox* subsidiary where epidermis covers the midvein the lateral walls are very thick and porous (*Fig. 5*). The stomata (*Fig. 9*) occur only on the lower face; they have no subsidiary cells, and are mostly surrounded by three ordinary epidermis-cells.

The chlorenchyma (*Fig. 7*) shows one stratum of typical palisades (*P*) and an open pneumatic tissue of three layers. Above and below the stronger lateral ribs and the mediane are strata of hypodermal collenchyma and of thin-walled water-storage tissue, which reaches its highest development in the midrib, and on the dorsal face of this. The mestome-strands are collateral and quite broad; they all possess closed parenchyma-sheaths. While no crystals were observable in *Phlox*, we find in the leaf of *Spigelia* small needle-shaped crystals of calcium oxalate in the colorless parenchyma that surrounds the veins.

Considered by themselves the leaves of our plants do possess a very distinct structure, by which they may be readily distinguished. Although they are bifacial in regard to the distribution of stomata as well as to the differentiation of the chlorenchyma, some characteristics may be pointed out so as to separate them from each other. For instance, the occurrence again of cystolithes in *Ruellia*, and the small glandular hairs observed in this genus (*Fig. 11*); furthermore, the presence of subsidiary cells in *Ruellia*, and their absence from the two other plants. The total lack of crystals in *Phlox* in contrast to *Ruellia* and *Spigelia;* furthermore, the cuticular striations are very characteristic of the species of *Phlox*. Glandular hairs like those observed in *Ruellia* and *Phlox* seem to be absent from *Spigelia*, while the short, more or less obtuse hairs (*Figs. 5* and *6*) are characteristic of this genus.

We might condense the anatomical characterization still farther, and state that *Spigelia Marilandica* L. has a four-winged stem and bicollateral mestome-strands, characters that are not to be found in either *Ruellia* or *Phlox*.

Brookland, D. C., October, 1906.

EXPLANATION OF PLATES.

PLATE 1.

Fig. 1. Stem leaf of *Spigelia Marilandica.*
Fig. 2. Stem leaf of *Ruellia ciliosa.*
Fig. 3. Basal leaf of Phlox ovata.
Fig. 4. Stem leaf of same.
Fig. 5. *Spigelia Marilandica;* epidermis of leaf from below the midrib.
Fig. 6. Same species; hair of leaf from below the midrib.
Fig. 7. Same species; transverse section of leaf. Ep. = epidermis of upper, $Ep.^{x}$ = epidermis of lower face; P = palisade-tissue; P^{1} = pneumatic tissue.
Fig. 8. *Ruellia ciliosa;* transverse section of leaf; letters as above.

PLATE 2.

Fig. 9. *Spigelia Marilandica;* epidermis from lower face of leaf, showing the stomata.
Fig. 10. *Ruellia ciliosa;* epidermis from lower face of leaf, showing a cystolithe, a glandular hair and a stoma.
Fig. 11. Same species; cross-section of leaf, showing epidermis with a glandular hair.
Fig. 12. *Phlox ovata;* epidermis from lower face of leaf.
Fig. 13. Same species; a hair from margin of leaf.
Fig. 14. Same species; transverse section of leaf, showing the thick-walled epidermis along the margin.
Fig. 15. Same species; a glandular hair from above the midrib.

THE ANATOMICAL METHOD.

By Theo. Holm.

The object of the anatomical method is to apply such microscopic-anatomical and micro-chemical characters, observable in the organs of animals and plants, to the systematic distinction of these. When we remember the enormous number of species that are known at present, and the steady increase of new ones, it does not seem strange that naturalists have felt, and long ago, the necessity of augmenting the modes of distinguishing the species. The systematic method, which confines itself to merely external morphological characters, was quite sufficient and satisfactory in earlier days, when only a limited number of species were known, and so long as the systematists did not look beyond the distinction externally of their species. But in recent years systematists have to deal with a much larger number of species, and are no longer satisfied with a mere superficial knowledge of these. Something more is desired, and

one of the great results gained by the use of the microscope is the discovery of internal characters of value to the distinction of species. Thus when our study and comparison of the external characters may fall short, valuable assistance may sometimes be rendered through a microscopical examination.

In botany the anatomical method has been in use for very near a century; however, it is only recently that the anatomical investigation has become methodically applied in the service of systematic botany. This one chapter of plant-anatomy thus plays an important role by being of practical use; however, it represents besides at the same time a prominent place in scientific botany by enlarging our knowledge of plant-structures.

The anatomical method, so far as concerns the identification of plants, is, of course, not a new one. In pharmacy, in phyto-paleontology and especially in cryptogamic botany, the anatomical method has been applied for many years. But in systematic botany, as stated above, as a means of distinguishing the higher plants, the methodical application of anatomical characters is somewhat modern.

The history of botany tells us about the earliest suggestions as to its possible application, and the earliest attempts to discover and appreciate the internal structures. Linnæus spoke of "formæ et structuræ"; De Candolle and Endlicher separated the *Monocotyledones* from the *Dicotyledones* by means of their structural divergences; Martius knew of the peculiar structure of the wood in Conifers; Mirbel, as early as 1810, wrote an anatomical monograph of the *Labiatæ*, followed soon by Chatin, Regnault, Duval-Jouve, and others. The methodical application of anatomical characters in higher plants is, on the other hand, more recent, the impulse being given by Radlkofer and Vesque, who demonstrated in a most clear and concise way that anatomical characters are not only very useful, but in a number of cases absolutely necessary for scientific classification of plants. From that time the botanical literature shows us the enormous results gained in later years through the use of the microscope: the broadened field in systematic botany and the rapid increase in the recording of anatomical distinctions of genera, of species, and even of families.

The anatomical method has also gained universal recognition in works on pharmacology. How would it be possible to ascertain the true nature of dried or pulverized drugs unless by means of a

microscopical examination? Broken rhizomes, roots or stems, as they often appear in the shape of drugs, often resemble superficially each other to such an extent that it seems impossible or at least extremely difficult to decide whether such specimens are roots or stems, or even leaves. This first step, however, is only elementary, and requires but little botanical knowledge; a microscopical examination soon shows us what they are, stems, roots or leaves. The difficulty comes in, when the question is to decide whether some given specimens really belong to a certain species, or whether they are something else and of lesser or no value. To settle such questions involves more than an ordinary botanical knowledge, and it is here that the anatomical method comes in as the most reliable guide, in the shape of a microscopic-anatomical or micro-chemical analysis.

But, plant-structures are manifold; in some genera the leaves are the only organs that possess structures sufficiently characteristic for the anatomical determination of the genus or species; in others, both the stems and roots may be necessary. Some certain plant-families are, on the other hand, so thoroughly characteristic in their structures that either the stems or the leaf may suffice for the identification. To utilize such anatomical characters requires, however, a large amount of literary research, and the literature on this subject is indeed very scattered. An important publication has, meanwhile, been offered by Dr. Solereder, who has gathered the most essential points known, so far, from anatomical botany, we find in his work: "Systematische Anatomie der Dicotyledonen" a most complete representation of the various structures possessed by these plants, arranged systematically, described methodically. From this important work the student who is familiar with plant-anatomy can gather much information, so as to be able to identify a number of plants anatomically.

Let us now present some few examples of the application of this method in order to demonstrate the importance of anatomical characters. The family *Ranunculaceæ* is so well known to students of pharmacology, since several of the genera occupy quite a prominent place among the officinal plants, and several are known for their poisonous properties.

A cross-section of the rhizome, of the stem above ground, and of the petiole shows in this family a certain structure of the mestome-strands, which otherwise is almost exclusively known from the

Monocotyledones. The vessels and the other elements of the hadrome are here arranged in the shape of the letter V, with the point toward the pith, and with the arms partly enclosing the leptome. *Pæonia*, however, makes an exception, since the mestome-bundles show in this genus the ordinary structure with the hadrome flattened where it borders on the leptome, and not surrounding this. In several of the herbaceous and woody species of this family a more or less continuous zone of stereome surrounds the mestome-strands, thus separating these from the cortical parenchyma.

If we examine the leaves we notice that the stomata lack subsidiary cells, and that they are surrounded by several ordinary epidermis-cells; furthermore that the palisade-tissue in some certain species shows the remarkable structure of "arm-palisades," first described by Haberlandt. *Aconitum Napellus* and *dissectum*, but not *A. uncinatum* show this structure, likewise *Caltha*, *Trollius*, several species of *Anemone*, *Clematis* and *Pæonia*.

The hairs show a very simple structure in this family, being mostly unicellular, even when developed as glandular hairs. Internal glands are not known from the family, but in *Eranthis* and *Helleborus* the parenchyma of the rhizomes and roots does contain an oily matter; besides that, the stems and roots of *Coptis*, *Hydrastis*, *Xanthorhiza* and certain species of *Thalictrum* contain yellow berberine.

One of the most interesting and striking characters is, however, to be found in the stem of certain herbaceous genera, as, for instance, *Actæa*, *Cimicifuga* and *Thalictrum*. In these the mestome-bundles are not located in one circular band and are not surrounded by a pericycle or an endodermis so as to represent a central cylinder, a stele, as in other Dicotyledones with normal structure. But we find in these genera two or more irregular bands of mestome-bundles, with no arrangement so as to constitute a stele. In other words, we meet with an astelic axis, a term proposed by Van Tieghem, and such structure is very rare among the *Dicotyledones*.

There are thus several characters by which this family may be distinguished, even if it does share some of these with genera of other families. For instance, the V-shaped outline of the hadrome, which recurs in some of the *Fumariaceæ*, *Plumbagineæ* and *Compositæ*. Also the unicellular glandular hairs are known from other families: *Malvaceæ*, *Tiliaceæ*, *Rutaceæ*, etc. The peculiar shape of the palisade-cells so very characteristic of *Filices*, *Equisetaceæ*, *Coni-*

feræ and *Gramineæ* occur also within the *Ranunculaceæ*, furthermore in some genera of *Araliaceæ*, *Caprifoliaceæ*, *Solanaceæ*, etc.

It is thus very difficult, if possible, to point out such characters as may be possessed by a certain family alone. However, if we examine the anatomical diagnoses of the various families, in which some of these peculiarities are to be found besides in the *Ranunculaceæ*, we then notice that only one or two of these may occur at the same time and accompanied by other characters not known from this family.

A family that has very many anatomical characters in common with others is that of the *Compositæ*. In this family we notice the superficial development of cork; the prismatic or needle-shaped crystals of calcium oxalate; the resiniferous and the articulated lacticiferous ducts; the numerous types of hairs, and, finally, the occurrence of mestome-strands in the pith, of leptome alone or with hadrome. By some of these characters the family may be distinguished, in spite of the fact that none of these are especially peculiar to the family. It is the structure in general of the *Compositæ* that makes them so very distinct among the other plants.

When compared, for instance, with the closely allied *Campanulaceæ*, the *Compositæ* show themselves remarkably distinct, even if the principal features be identical to both. In the *Campanulaceæ* we meet with the same distribution of the mestrome-strands in the pith, with or without hadrome; we notice the occurrence of articulated laticiferous ducts, the presence of inulin, etc. But the *Campanulaceæ* lack crystals of calcium oxalate and resiniferous ducts; they possess, on the other hand, sphærocrystals and the very peculiar cystolithic hairs.

The application of the anatomical method means a continued comparison and a study of plant-structures; it has proved to be very useful, however; besides that, it teaches us so very much about the organization of the plants, illustrated by the structures and functions of the various tissues.

BROOKLAND, D. C., December, 1906.

A GOOD METHOD MADE WORTHLESS BY UNWARRANTED MODIFICATIONS.

By H. M. Gordin.

The method adopted by the U.S.P. 1900 for the estimation of strychnine in nux vomica has been pronounced unreliable by many chemists who have given the method a fair trial. A review of the work of several analysts on the verification of the method is given in the January number of this Journal by Webster and Pursel, who find that when the directions of the U.S.P. are followed and a nitric acid having the specific gravity 1·40 is used in the method the results are perfectly erratic, while if an acid is used having the specific gravity 1·42 the results obtained are very good. Under the generally prevailing impression that the U.S.P. method is identical with the one published by me in 1902 (see *Proc. Am. Ph. A.*, 1902, 336, and *Arch. Pharm.*, 1902, 641) the chemists, in criticizing the method, frequently refer to it as Gordin's method. I am therefore compelled to emphasize the fact that the directions in the U.S.P. method are different from those I gave in my original paper, and that the Committee of Revision has without any good reason and moreover, *in spite of my vigorous protest*, modified my method in such a way as to ruin it completely. On looking up my method as given in the above named references it will be seen that I direct to use a nitric acid having the specific gravity 1·42 and to add a little amyl alcohol at the end of the evaporation of the alkaloidal solution in order to avoid loss through spurting. The Committee left the amyl alcohol out entirely and changed the strength of the nitric acid from 1·42 to 1·40. As according to Lunge and Rey these two specific gravities correspond respectively to 69·8 and 65·3 per cent. of absolute HNO_3, the stronger acid cannot be replaced by the weaker without destroying the whole value of the method.

While in changing my method the Committee was undoubtedly animated by a praiseworthy desire to make it simpler, it ought to be clear to the members of the Committee by this time that for the credit of the authority of the U.S.P. it is absolutely imperative that the strychnine assay should be without delay replaced by the one I have given in my paper. As an acid of the specific gravity 1·42 can be obtained from any wholesale house and the simple addition of a few drops amyl alcohol effectively prevents possible loss of strychnine, there can be no reason why the method should not be

given exactly as I have worked it out. In our school the method has been used by dozens of students with excellent results, but our students instead of using the U.S.P. method work according to directions copied by the instructors from my original article.

NORTHWESTERN UNIVERSITY SCHOOL OF PHARMACY.

NOTES ON SOME PLANTS WHICH IN DRYING STAIN PAPER.[1]

By J. H. MAIDEN, Government Botanist and Director of the Botanic Gardens, Sydney.

Everyone with herbarium experience must have made the observation that some plants stain the papers to which they are attached. Some, indeed, stain so persistently (e.g. *Drosera Whittakeri*) that the coloring matter will penetrate a dozen sheets or more. I have not observed that any botanist has drawn special attention to the matter and do not know that any one has given an explanation of these phenomena. I say phenomena, because the coloring or rather staining may arise from various causes, *e.g.* the presence of a specific coloring matter in the root or other portion of the plant, or the formation of a coloring matter by oxidization or other chemical change. The subject is of course one for a chemist, who will subject the paper itself to examination.

It will be observed that the plants, in many cases, leave sharp photographic impressions on the paper. The phenomena arise from an emanation,—a dry distillation possibly. It is proper to point out that herbarium specimens in the National Herbarium, Sydney, are protected from insect ravages by means of naphthaline. No bichloride of mercury is used, but most plants are placed in a bisulphide of carbon chamber before they are placed in the herbarium boxes.

Most of the stains appear to be purplish, of varying intensity; the remainder are mostly greys and browns. The drying black of plants which do not stain is a cognate matter which must not be confused with the subject of staining. Many saprophytes and root parasites dry black, e.g. *Monotropa* (Monotropaceæ), *Gerardia* (Scro-

[1] Read before the Royal Society of N. S. Wales, June 6, 1906, and reprinted from *Journal and Proceedings of the Royal Society of N. S. W.*, Vol. XL, pp. 39–45.

phulariaceæ), *Comandra* (Santalaceæ). Some *Veronicas*, apparently not root-parasitic, dry black, as also do some *Utricularias*. In *Zygophyllum* there is some stain, but this apparently emanates from the juice only of the succulent plant, and this belongs to a different class of phenomena.

I submit to you a list of a few plants (arranged in natural orders alphabetically) which I have observed as having stained paper in my own herbarium. The list is too small for me to deduce much as regards botanical relationships; it may be added to as search in this and other large herbaria will undoubtedly bring forth many additional instances.

BIXCAEÆ.

Scolopia Gerrardi, Harv. (South Africa).
Oncoba spinosa, Forsk. (Arabia).
Azara microphylla, Hook. (Chili).

These plants, from widely different countries, produce a greenish-grey, greasy looking stain, the *Scolopia* and the *Azara* very abundantly, the *Oncoba* to a less extent.

BORAGINACEÆ.

Alkanna tinctoria, Tausch.

The root produces a purple stain, the well-known alkanet.

COMPOSITÆ.

Helichrysum baccharoides, F.v.M., Australia.

The whole plant produces a red to purple blush.

CONVOLVULACÆ.

Ipomœa heterophylla, R.Br.

The young leafy tips of this Australian plant produce a reddish-brown stain.

DROSERACEÆ.

The first reference to the staining power of Australian *Droseras* I can find is as follows[1]:—"These Droseracous plants appear likely to be in some cases of commercial value as dyers' plants. Every part of *D. gigantea* stains paper of a brilliant deep purple; and

[1] Appendix to Edwards' *Botanical Register*:—"A sketch of the vegetation of the Swan River Colony," by John Lindley, XXI (1889).

when fragments are treated with ammonia they yield a clear yellow. The bulbs of *D. erythrorrhiza* and *stolonifera* possess the same property; in these there is a deep scarlet powder secreted by the scales of the bulbs, which is instantly dissolved in ammonia, forming at first an orange-colored fluid of great richness, but it soon changes to the rich purple above mentioned."

Hooker[1] largely follows Lindley in some remarks on *D. stolonifera*, Endl. Later on, Bentham[2] remarks, "Nearly all the species of this section (Ergaleium) dye the paper in which they are preserved a rich carmine or purple color."

It remained, however, for Prof. E. H. Rennie of Adelaide to examine the coloring matter of this genus. He first extracted two beautiful red coloring matters from the corms,[3] and subsequently submitted these coloring matters to an exhaustive examination.[4]

GENTIANACEÆ.

Gentiana saxosa, Forst., from the Australian Alps, gives a yellowish-brown, but not strong strain.

LOGANIACEÆ.

Logania linifolia, Schlecht. A specimen from the Mallee district, Victoria, stains paper very strongly purplish; the stain actually goes through the paper.

L. ovata, R. Br. and *L. longifolia*, R. Br., also Australian plants, likewise exhibit marked stains.

Strychnos psilosperma, F. v. M., N. S. Wales and Queensland, affords a purplish stain, not so intense as *Logania*.

OLEACEÆ.

Jasminum simplicifolium, Forst. Specimens from New South Wales and Lord Howe Island exhibit a greasy-looking grey stain.

MYRTACEÆ.

Some species of *Eucalyptus* exhibit a greyish stain, which does not appear to be an oil stain. Instances are *E. virgata*, Sieb., and its variety *obtusiflora*; also *E. Luehmanniana*, F.v.M.

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[1] *Icones Plantarum*, Vol. IV, tab. 389 (1841).

[2] *Flora Australiensis*, II, 462.

[3] *Journ. Chem. Soc.*, April, 1887.

[4] "The coloring matter of *Drosera Whittakeri*," *Journ. Chem. Soc.*, LXIII, 1083 (1893).

POLYGALACEÆ.

Comesperma retusum, Labill., *C. sylvestre*, Lindl., and *C. ericinum*, DC., stain the paper purplish. This tends to confirm the close affinity between these three Eastern Australian species, already ascertained on morphological grounds.

The stain is also seen in *C. flavum*, DC., and *C. calymega*, Labill., two Western Australian species. The stain is of considerable persistence, it being well marked in Dr. Leichhardt's specimens collected in 1843.

The stain is most marked in *C. retusum* so far as my specimens go. I have also observed that in some specimens (e.g., *C. ericinum*) the purplish stain is succeeded by a dull brown one. This opens the enquiry as to how long the purple stain persists as such and when it changes color in the cases in which it appears to change with age.

RANUNCULACEÆ.

Clematis pubescens, Huegel, a Western Australian species, affords a purplish-brown stain which I notice in no other species.

RHAMNACEÆ.

Alphitonia excelsa, Reissek. A well marked brown stain is observable in specimens from the Kurrajong, N.S.Wales. I do not notice it in specimens from other localities. This may be connected with the coloring matter surrounding the seeds, but the pigment which has made such a marked photographic representation of the included plant must be somewhat volatile.

SAMYDACEÆ.

Homalium rufescens, Benth., a Natal plant, exhibits a grey, not abundant, stain.

SANTALACEÆ.

Fusanus persicarius, R. Br., and *F. acuminatus*, DC. (Quandong) both Australian plants, show a profuse brown stain. *Fusanus* is, according to some botanists, congeneric with *Santalum*. I do not notice the stains in any species of *Santalum* (as recognized by Bentham).

SCROPHULARIACEÆ.

The *Veronicas* are very interesting in this connection, affording a dark purplish stain. This is seen in Australian species including *V. formosa*, R. Br., *V. nivea*, Lindl., *V. arenaria*, Cunn. Amongst New Zealand species we have *V. vernicosa*, Hook. f., *V. loganioides*, Armstrong, *V. Lyalli*, Hook. f., and *V. Traversi*, Hook. f. In European species I have noticed it in *V. fruticulosa*, Linn. (very abundant); *V. alpina*, Linn.; *V. serpyllifolia*, Linn. (England); *V. saxatilis*, Jacq. (Switzerland).

VERBENACEÆ.

Lippia nodiflora, Linn. I notice a stain in one specimen from Byron Bay, N. S. Wales, but not in specimens from other parts of the world.

* * * *

I have taken no cognizance of Cryptogams, but Mr. Richard Helms, a member of our Society, has obligingly exhibited some species of *Hymenophyllum*, and has furnished the following notes on them:—"There are three species of New Zealand ferns known to me which stain the drying paper. These are *Hymenophyllum polyanthos*, *H. villosum* and *H. bivalve*.

"There is no difficulty with ordinary care to dry the filmy ferns in their natural colors, and each of these mentioned are no exception. *H. polyanthos* sometimes develops fronds to seven inches (without the stalk) which are of a dense dark green, and show the venation indistinctly, making when first dried exceptionally handsome specimens. Soon after getting perfectly dry this fern develops a peculiar, rather strong odor, of which I do not know anything similar. It is however not unpleasant, although neither exactly pleasant. The strength of this odor increases for a considerable time and then it gradually diminishes, yet lasting for many years. My specimens collected upwards of twenty years ago still retain it slightly. If ever so carefully kept in a perfectly dry state and excluded from moisture variations in the atmosphere, this fern will become discolored in often less than a month after first being dried, getting soon quite brown. At this time it begins to stain the paper. The stain like the frond brown is undoubtedly of an oily nature, and soon will penetrate a sheet of tissue paper, leaving on both sides of

it a perfect impression, which may gradually penetrate a number of layers of even thicker paper.

"*H. villosum* is a mountain species occurring from 2,500 to 5,000 feet. It is in my opinion purely a very characteristic variety of *H. polyanthos.* It is not of the dark even green colors as this fern, but when first dried rather faintly streaky and showing the venation distinctly. Its fronds are generally not over 2½ to 3 inches long, excluding the fine stalk which varies in length according to situation. It discolors in a similar manner as *H. polyanthos* and stains the paper likewise with an oily impression. The peculiar odor is however not so strong as with *H. polyanthos.* Distinct differences may be observed in these two ferns, but the peculiar odor as well as the oily exudation common to both characterizes them as mere varieties of the same species.

"*H. bivalve* can also not be kept green for many months after preparation. It dries a peculiar delicate green with a faint milky hue and discolors to a pale brown in a few months. It does not develop any peculiar odor after being dried, and does not always stain the paper and generally only faintly when it does. The stain however looks oily."

NEW AND NON-OFFICIAL REMEDIES.[1]

The following articles have been tentatively approved by the Council on Pharmacy and Chemistry of the American Medical Association. The list will be revised by adding other articles as accepted and by omitting any which on further investigation may be found to conflict with the rules of the Council.

Following the name of each article is the name of the manufacturer or, in case of foreign products, of the American agent; where no name is given the article is believed to be protected by neither patent nor trademark. The date following the article refers to the preliminary publication in *The Journal of the American Medical Association.* When no date is given the description has not yet been published. This list, brought up to date, will appear in the first issue of *The Journal of the American Medical Association* of each month.

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[1] From *The Journal of the American Medical Association.*

Acetozone (P. D. & Co.), Sept. 15, 1906.
Acetozone Inhalant (P. D. & Co.), Sept. 15, 1906.
Acet-theocinsodium (Cont. Color and Chem. Co.), Sept. 15, 1906.
Adnephrin Emollient (Stearns & Co.), Sept. 15, 1906.
Adnephrin Oil Spray (Stearns & Co.), Sept. 15, 1906.
Adnephrin Solution (Stearns & Co.), Sept. 15, 1906.
Adnephrin Suppositories (Stearns & Co.).
Adrenalin (P. D. & Co.), Sept. 15, 1906.
Adrenalin Chloride Solution (P. D. & Co.), Sept. 15, 1906.
Adrenalin Suppositories (P. D. & Co.), Sept. 15, 1906.
Agurin (Cont. Color and Chem. Co.), Sept. 15, 1906.
Airol (Hoffman-LaRoche Chem. Works), Sept. 15, 1906.
Albargin (Koechl & Co.).
Alpha-Eucaine Hydrochloride (Schering & G.), Sept. 15, 1906.
Alphozone (Stearns & Co.), Sept. 15, 1906.
Alphozone Tablets (Stearns & Co.), Sept. 15, 1906.
Alumnol (Koechl & Co.), Sept. 15, 1906.
Alypin (Cont. Color and Chem. Co.).
Aminoform (Bischoff & Co.), Sept. 15, 1906.
Anesthesin (Koechl & Co.), Sept. 15, 1906.
Anthrasol (Knoll & Co.).
Antipyrine Salicylate, Sept. 15, 1906.
Antithermoline (G. W. Carnrick & Co.), Sept. 15, 1906.
Antithyroidin (Merck & Co.), Sept. 15, 1906.
Antithyroid Preparations, Sept. 15, 1906.
Argentamin (Schering & G.), Sept. 15, 1906.
Argonin (Koechl & Co.), Sept. 15, 1906.
Argyrol (Barnes & Hille), Sept. 15, 1906.
Aristochin (Cont. Color and Chem. Co.), Sept. 22, 1906.
Aristol (Cont. Color and Chem. Co.), Sept. 22, 1906.
Aspirin (Cont. Color and Chem. Co.), Sept. 22, 1906.
Benzosol (Koechl & Co.), Sept. 22, 1906.
Beta-Eucaine Hydrochloride (Schering & G.), Sept. 22, 1906.
Beta-Naphthol Benzoate (Merck & Co.), Sept. 22, 1906.
Betol (Heyden Chem. Works), Sept. 22, 1906.
Bismal (Merck & Co.), Sept. 22, 1906.
Borochloretone (P. D. & Co.), Sept. 22, 1906.
Brometone (P. D. & Co.), Sept. 22, 1906.
Bromipin—10 per cent. (Merck & Co.), Sept. 29, 1906.

Bromipin—33⅓ per cent. (Merck & Co.), Sept. 29, 1906.
Butyl-Chloralhydrate, Sept. 29, 1906.
Calcium Ichthyol (Merck & Co.), Sept. 29, 1906.
Calomelol (Heyden Chem. Works), Sept. 29, 1906.
Calomelol Ointment (Heyden Chem. Works), Sept. 29, 1906.
Cascara Evacuant (P. D. & Co.), Sept. 29, 1906.
Cascara Tonic Laxative Globules (P. D. & Co.), Sept. 29, 1906.
Chinaphenin (Cont. Color and Chem. Co.), Sept. 29, 1906.
Chloralamid (Schering & G.).
Chlorbutanol, Sept. 29, 1906.
Chloretone (P. D. & Co.), Sept. 29, 1906.
Chloretone Inhalant (P. D. & Co.), Sept. 29, 1906.
Citarin (Cont. Color and Chem. Co.), Sept. 29, 1906.
Collargol (Schering & G.).
Collargal Ointment (Schering & G.).
Creosotal (Cont. Color and Chem. Co.), Oct. 6, 1906.
Cresylone (P. D. & Co.),
Cupro-Hemol (Merck & Co.).
Dentalone (P. D. & Co.), Oct. 6, 1906.
Dermatol (Koechl & Co.) Oct. 6, 1906.
Diabetin (Schering & G.), Oct. 6, 1906.
Dionin (Merck & Co.), Oct. 6, 1906.
Diuretin (Merck & Co.), Oct. 6, 1906.
Duotal (Cont. Color and Chem. Co.), Oct. 6, 1906.
Duotonol (Schering & G.), Oct. 6, 1906.
Elixir Eupnein (Schieffelin & Co.), Oct. 6, 1906.
Elixir Saw Palmetto (P. D. & Co.), Oct. 6, 1906.
Empyroform (Schering & G.), Oct. 6, 1906.
Epicarin (Cont. Color and Chem. Co.), Oct. 6, 1906.
Erythol Tetranitrate (Merck & Co.), Oct. 6, 1906.
Ethylenediamine (Schering & G.), Oct. 6, 1906.
Eucaine, Oct. 6, 1906.
Eucaloids (Edward G. Binz), Oct. 6, 1906.
Eucamul (Edward G. Binz), Oct. 13, 1906.
Euformol (P. D. & Co.).
Eugallol (Knoll & Co.), Oct. 13, 1906.
Eumydrin (Cont. Color and Chem. Co.), Oct. 13, 1906.
Euphorin (Fbrk. v. Heyden), Oct. 13, 1906.
Euphthalmin (Schering & G.), Oct. 13, 1906.

Euquinine (Merck & Co.), Oct. 13, 1906.
Euresol (Knoll & Co.), Oct. 13, 1906.
Euresol Soap (Knoll & Co.), Oct. 13, 1906.
Europhen (Cont. Color and Chem. Co.), Oct. 13, 1906.
Exodin (Schering & G.).
Ferrichthyol (Merck & Co.), Oct. 13, 1906.
Ferripyrine (Koechl & Co.), Oct. 13, 1906.
Ferropyrine (Knoll & Co.), Oct. 13, 1906.
Formalin (Schering & G.), Oct. 13, 1906.
Formin (Merck & Co.), Oct. 13, 1906.
Gallogen (Bischoff Co.), Oct. 13, 1906.
Germicidal Soap (P. D. & Co.), Oct. 13, 1906.
Glutol-Schleich (Schering & G.), Oct. 13, 1906.
Glycerin Emollient (P. D. & Co.), Oct. 13, 1906.
Glycerophosphates, Oct. 13, 1906.
Guaiacol-Salol (Merck & Co.), Oct. 13, 1906.
Guaiamar (Mallinckrodt Chem. Works), Oct. 20, 1906.
Guajasanol (Koechl & Co.), Oct. 20, 1906.
Haemoferrum (Stearns & Co.).
Hedonal (Cont. Color and Chem. Co.), Oct. 20, 1906.
Helmitol (Cont. Color and Chem. Co.), Oct. 20, 1906.
Hemicranin (Cont. Color and Chem. Co.), Oct. 20, 1906.
Hemogallol (Merck & Co.), Oct. 20, 1906.
Hemol (Merck & Co.).
Hemoquinine (Schieffelin & Co.), Oct. 20, 1906.
Heroin (Cont. Color and Chem. Co.), Oct. 20, 1906.
Heroin Hydrochloride (Cont. Color and Chem. Co.), Oct. 20, 1906.
Heromal (Schieffelin & Co.), Oct. 20, 1906.
Heroterpine (Schieffelin & Co.), Oct. 20, 1906.
Hetol (Merck & Co.), Oct. 20, 1906.
Hexamethylenamine Methylencitrate, Oct. 27, 1906.
Holocaine Hydrochloride (Koechl & Co.), Oct. 27, 1906.
Hypnal (Koechl & Co.), Oct. 27, 1906.
Ichthalbin (Knoll & Co.), Oct. 27, 1906, Nov. 10, 1906.
Ichthammon (F. Reichelt), Oct. 27, 1906.
Ichthargan (Ichthyol Co.), Oct. 27, 1906.
Ichthermol (Merck & Co.), Oct. 27, 1906.
Ichthoform (Merck & Co.), Oct. 27, 1906.
Ichthyol (Merck & Co.), Oct. 27, 1906.

Ichthyolum Austriacum (G. Heil & Co.), Oct. 27, 1906.
Iodipin—10 per cent. (Merck & Co.), Oct. 27, 1906.
Iodipin—25 per cent. (Merck & Co.), Nov. 3, 1906.
Iodoformogen (Knoll & Co.), Nov. 3, 1906.
Iodothyrine (Cont. Color and Chem. Co.), Nov. 3, 1906.
Iothion (Cont. Color and Chem. Co.), Nov. 3, 1906.
Isoform Powder (Koechl & Co.), Nov. 3, 1906.
Isopral (Cont. Color and Chem. Co.), Nov. 3, 1906.
Kasagra (Stearns & Co.), Nov. 3, 1906.
Kola, Stearns (Stearns & Co.), Nov. 3, 1906.
Kresamine (Schering & G.), Nov. 3, 1906.
Lac Bismo (E. J. Hart & Co.), Nov. 3, 1906.
Lactophenin (Chem. Fbrk. vrm. Goldenberg, Geromont & Co.), Nov. 3, 1906.
Laminoids Ferruginous (Nascent) (Schieffelin & Co.), Nov. 3, 1906.
Lennigallol (Knoll & Co.), Nov. 3, 1906.
Liquor Tritici (P. D. & Co.), Nov. 3, 1906.
Lithium Ichthyol (Merck & Co.), Nov. 3, 1906.
Lycetol (Cont. Color and Chem. Co.), Nov. 3, 1906.
Lysidin (Koechl & Co.), Nov. 3, 1906.
Mercurol (P. D. & Co.), Nov. 3, 1906.
Mesotan (Cont. Color and Chem Co.), Nov. 3, 1906.
Methaform (Stearns & Co.), Nov. 3, 1906.
Migrainin (Koechel & Co.), Nov. 3, 1906.
Neurocaine (Schieffelin & Co.), Nov. 3, 1906.
Neuronidia (Schieffelin & Co.), Nov. 3, 1906.
Novargan (Heyden Chem. Works).
Novocaine (Koechl & Co.), Nov. 10, 1906.
Nutrose (Koechl & Co.), Nov. 3. 1906.
Oil of Eucalyptus, globules (E. G. Binz.).
Organic Iron Preparations.
Orthoform-New (Koechl & Co.), Nov. 10, 1906.
Orthoform-New Hydrochloride (Koechl & Co.), Nov. 10, 1906.
Ovoferrin (Barnes & Hille), Nov. 10, 1906.
Oxaphor (Koechl & Co.), Nov. 10, 1906.
Pegnin (Koechl & Co.), Nov. 17, 1906.
Phenacetin (Cont. Color and Chem. Co.), Nov. 10, 1906.
Phenocoll Hydrochloride (Schering & G.), Nov. 10, 1906.
Phenocoll Salicylate, Nov. 10, 1906.

Piperazine (Cont. Color and Chem. Co., Schering & G.), Nov. 17, 1906.
Pollantin (Fritzsche Brothers), Nov. 17, 1906.
Pollantin Powder (Fritzsche Brothers), Nov. 17, 1906.
Protargol (Cont. Color and Chem. Co.).
Purgatin (Knoll & Co.), Nov. 17, 1906.
Pyramidon (Koechl & Co.), Nov. 17, 1906.
Pyramidon Neutral Camphorate (Koechl & Co.), Nov. 17, 1906.
Pyramidon Acid Camphorate (Koechl & Co.), Nov. 17, 1906.
Pyramidon Salicylate (Koechl & Co.), Nov. 17, 1906.
Quartonol (Schering & G.), Nov. 24, 1906.
Red Bone Marrow (Armour & Co.).
Sajodin (Cont. Color and Chem. Co.).
Sal Ethyl (P. D. & Co.), Nov. 24, 1906.
Saliformin (Merck & Co.), Nov. 24, 1906.
Salit (Heyden Chem. Works), Nov. 24, 1906.
Salophen (Cont. Color and Chem. Co.), Nov. 24, 1906.
Saloquinine (Merck & Co.), Nov. 24, 1906.
Saloquinine Salicylate (Merck & Co.), Nov. 24, 1906.
Santyl (Knoll & Co.).
Sextonol (Schering & G.), Nov. 24, 1906.
Sidonal (Koechl & Co.), Nov. 24, 1906.
Sodium Cacodylate, Nov. 24, 1906.
Sodium Cinnamate, Nov. 24, 1906.
Sodium Ichthyol (Merck & Co.), Dec. 1, 1906.
Stovaine (Walter F. Sykes), Dec. 1, 1906.
Stypticin (Merck & Co.), Dec. 1, 1906.
Styptol (Knoll & Co.), Dec. 1, 1906.
Styracol (Knoll & Co.), Dec. 1, 1906.
Sublamine (Schering & G.), Dec. 8, 1906.
Sulphonal (Cont. Color and Chem. Co.), Dec. 8, 1906.
Suprarenal Alkaloid, Dec. 8, 1906.
Suprarenal Liquid (P. D. & Co.).
Suprarenalin (Armour & Co.).
Suprarenalin Ointment (Armour & Co.),
Suprarenalin Solution (Armour & Co).
Suprarenalin Triturates (Armour & Co.).
Tannalbin (Knoll & Co.), Dec. 15, 1906.
Tannigen (Cont. Color and Chem. Co.), Dec. 8, 1906.
Tannoform (Merck & Co.), Dec. 15, 1906.

Tannopin (Cont. Color and Chem. Co.), Dec. 15, 1906.
Theobromine, Dec. 15, 1906.
Theobromine Sodium Salicylate, Dec. 15, 1906.
Theocin (Cont. Color and Chem. Co.), Dec. 22, 1906.
Theophyllin, Dec. 22, 1906.
Thermodin (Merck & Co.), Dec. 22, 1906.
Thiocol (Hoffmann-LaRoche Chem. Works), Dec. 22, 1906.
Thiosinamine.
Thyreoidectin (P. D. & Co.).
Tonic Hypophosphites (Sharp & Dohme).
Tonols (Schering & G.), Dec. 22, 1906.
Triferrin (Knoll & Co.).
Triferrol (Knoll & Co.).
Trikesol (Schering & G.).
Trional (Cont. Color and Chem. Co.).
Trioxymethylene (Merck & Co.).
Triphenin (Merck & Co.).
Tritipalm (Stearns & Co.).
Tropacocain Hydrochloride (Merck & Co.).
Trypsogen (G. W. Carnick Co.).
Tumenol-Ammonium (Koechl & Co.).
Tumenol (Koechl & Co.).
Tumenol Sulphone (Koechl & Co.).
Tumenol Sulphonic Acid (Koechl & Co.).
Tussol (Koechl & Co.).
Urethane (Merck & Co.).
Uriform (Schieffelin & Co.).
Uritone (P. D. & Co.).
Uropherin (Merck & Co.).
Urotropine (Schering & G.).
Urotropine-New (Schering & G.).
Validol (Bischoff & Co.).
Validol Camphoratum (Bischoff & Co.),
Valyl (Koechl & Co.).
Veronal (Merck & Co.).
Vibutero (Stearns & Co.).
Vinum Extracti Morrhuae (Stearns & Co.).
Vioform (Bischoff & Co.).
Vioform Gauze (Bischoff & Co.).
Xeroform (Heyden Chem. Works).

DRAFT OF A MODEL STATE PURE FOOD AND DRUG LAW.[1]

Suggested by the Chairman of the Committee on Legislation of the National Wholesale Druggists' Association.

AN ACT For preventing the manufacture or sale of adulterated or misbranded foods or drugs.

Be it enacted—

SECTION 1. That it shall be unlawful for any person to manufacture or sell or offer for sale any article of food or drug which is adulterated or misbranded, within the meaning of this Act; and any person who shall violate any of the provisions of this section shall be guilty of a misdemeanor, and for each offence shall, upon conviction thereof, be fined not to exceed dollars or shall be sentenced to one year's imprisonment, or both such fine and imprisonment, in the discretion of the court, and for each subsequent offense and conviction thereof shall be fined not less than dollars or sentenced to one year's imprisonment, or both such fine and imprisonment, in the discretion of the court. *Provided*, That no article shall be deemed misbranded or adulterated within the provisions of this Act when intended for export to any foreign country and prepared or packed according to the specifications or directions of the foreign purchaser when no substance is used in the preparation or packing thereof in conflict with the laws of the foreign country to which said article is intended to be shipped; but if said article shall be in fact sold or offered for sale for domestic use or consumption, then this proviso shall not exempt said article from the operation of any of the other provisions of this Act.

SEC. 2. That the term "drug," as used in this Act, shall include all medicines and preparations recognized in the United States Pharmacopœia or National Formulary for internal or external use, and any substance or mixture of substances intended to be used for the cure, mitigation, or prevention of disease of either man or other animals. The term "food," as used herein, shall include all articles used for food, drink, confectionery, or condiment by man or other animals, whether simple, mixed, or compound.

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[1] This copy was furnished through the courtesy of Mahlon N. Kline, Chairman of the Committee on Legislation of the National Wholesale Druggists' Association.—EDITOR.

SEC. 3. That for the purpose of this Act an article shall be deemed to be adulterated:

In case of drugs:

First. If, when a drug is sold under or by a name recognized in the United States Pharmacopœia or National Formulary, it differs from the standard of strength, quality, or purity, as determined by the test laid down in the United States Pharmacopœia or National Formulary official at the time of investigation: *Provided*, That no drug defined in the United States Pharmacopœia or National Formulary shall be deemed to be adulterated under this provision if the standard of strength, quality, or purity be plainly stated upon the bottle, box, or other container thereof, although the standard may differ from that determined by the test laid down in the United States Pharmacopœia or National Formulary.

Second. If its strength or purity fall below the professed standard or quality under which it is sold.

In the case of confectionery:

If it contain terra alba, barytes, talc, chrome yellow, or other mineral substance or poisonous color or flavor, or other ingredient deleterious or detrimental to health, or any vinous, malt, or spirituous liquor or compound or narcotic drug.

In the case of food:

First. If any substance has been mixed and packed with it so as to reduce or lower or injuriously affect its quality or strength.

Second. If any substance has been substituted wholly or in part for the article.

Third. If any valuable constituent of the article has been wholly or in part abstracted.

Fourth. If it be mixed, colored, powdered, coated, or stained in a manner whereby damage or inferiority is concealed.

Fifth. If it contain any added poisonous or other added deleterious ingredient which may render such article injurious to health: *Provided*, That when in the preparation of food products for shipment they are preserved by any external application applied in such manner that the preservative is necessarily removed mechanically, or by maceration in water, or otherwise, and directions for the removal of said preservative shall be printed on the covering or the package, the provisions of this Act shall be construed as applying only when said products are ready for consumption.

Sixth. If it consists in whole or in part of a filthy, decomposed, or putrid animal or vegetable substance, or any portion of an animal unfit for food, whether manufactured or not, or if it is the product of a diseased animal, or one that has died otherwise than by slaughter.

SEC. 4. That the term "misbranded," as used herein, shall apply to all drugs, or articles of food, or articles which enter into the composition of food, the package or label of which shall bear any statement, design, or device regarding such article, or the ingredients or substances contained therein which shall be false or misleading in any particular, and to any food or drug product which is falsely branded as to the State, Territory, or country in which it is manufactured or produced.

That for the purposes of this Act an article shall also be deemed to be misbranded:

In case of drugs:

First. If it be an imitation of or offered for sale under the name of another article.

Second. If the contents of the package as originally put up shall have been removed, in whole or in part, and other contents shall have been placed in such package, or if the package fail to bear a statement on the label of the quantity or proportion of any alcohol, morphine, opium, cocaine, heroin, alpha or beta eucaine, chloroform, cannabis indica, chloral hydrate, or acetanilide, or any derivative or preparation of any such substances contained therein: *Provided*, That nothing in this paragraph shall be construed to apply to the filling of written prescriptions, furnished by regular licensed practicing physicians, and kept on file by druggists, or as to such preparations as are specified and recognized by the United States Pharmacopœia or National Formulary, which are in accordance therewith.

In the case of food:

First. If it be an imitation of or offered for sale under the distinctive name of another article.

Second. If it be labeled or branded so as to deceive or mislead the purchaser, or purport to be a foreign product when not so, or if the contents of the package as originally put up shall have been removed in whole or in part and other contents shall have been placed in such package, or if it fail to bear a statement on the label

of the quantity or proportion of any morphine, opium, cocaine, heroin, alpha or beta eucaine, chloroform, cannabis indica, chloral hydrate, or acetanilide, or any derivative or preparation of any such substances contained therein.

Third. If in package form, and the contents are stated in terms of weight or measure, they are not plainly and correctly stated on the outside of the package.

Fourth. If the package containing it or its label shall bear any statement, design, or device regarding the ingredients or the substances contained therein, which statement, design, or device shall be false or misleading in any particular: *Provided*, That an article of food which does not contain any added poisonous or deleterious ingredients shall not be deemed to be adulterated or misbranded in the following cases:

First. In the case of mixtures or compounds which may be now or from time to time hereafter known as articles of food, under their own distinctive names, and not an imitation of or offered for sale under the distinctive name of another article, if the name be accompanied on the same label or brand with a statement of the place where said article has been manufactured or produced.

Second. In the case of articles labeled, branded, or tagged so as to plainly indicate that they are compounds, imitations, or blends, and the word "compound," "imitation," or "blend," as the case may be, is plainly stated on the package in which it is offered for sale: *Provided*, That the term blend as used herein shall be construed to mean a mixture of like substances, not excluding harmless coloring or flavoring ingredients used for the purpose of coloring and flavoring only: *And provided further*, That nothing in this Act shall be construed as requiring or compelling proprietors or manufacturers of proprietary foods which contain no unwholesome added ingredient to disclose their trade formulas, except in so far as the provisions of this Act may require to secure freedom from adulteration or misbranding.

SEC. 5. That no dealer shall be prosecuted under the provisions of this Act when he can establish a guaranty signed by the wholesaler, jobber, manufacturer, or other party residing in this State, from whom he purchases such articles, to the effect that the same is not adulterated or misbranded within the meaning of this Act, designating it. Said guaranty, to afford protection, shall contain

the name and address of the party or parties making the sale of such articles to such dealer, and in such case said party or parties shall be amenable to the prosecutions, fines, and other penalties which would attach, in due course, to the dealer under the provisions of this Act.

SEC. 6. It shall be the duty of the State Dairy and Food Commissioner to enforce all the provisions of this Act which relate to foods, and it shall be the duty of the State Board of Pharmacy to enforce all the provisions of this Act which relate to drugs.

SEC. 7. This Act shall take effect on the day of

DRAFT OF THE PROPOSED GEORGIA FOOD AND DRUG LAW.[1]

A BILL

To be entitled an Act to prevent the adulteration, misbranding and imitation of foods for man or beast, of beverages, candies and condiments, of medicines, drugs and liquors, or the manufacture and sale thereof in the State of Georgia, prescribing a penalty for the violation hereof; providing for the inspection and analysis of the articles described by the Georgia State Department of Agriculture, charging the State's solicitors with the enforcement hereof, and providing means therefor, and repealing all laws and parts of laws in conflict herewith.

SECTION 1. Be it enacted, That it shall be unlawful for any person to manufacture, sell or offer for sale within the State of Georgia, any article of food, drugs, medicines, or liquors, which is adulterated or misbranded, or which contains any poisonous or deleterious substance within the meaning of this Act; and any person who shall violate any of the provisions of this section shall be guilty of a misdemeanor, and for each offence shall, upon conviction thereof, be fined not to exceed five hundred dollars, or shall be sentenced to one year's imprisonment, or both such fine and imprisonment, in the discretion of the court; and for each subsequent offence, and on conviction thereof shall be fined not exceeding one thousand dollars,

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[1] Only that portion of the draft relating to drugs is here printed, sections 12 to 23 relating more especially to feeding stuffs are omitted.

or sentenced to one year's imprisonment or both such fine and imprisonment, in the discretion of the court; *provided*, that in case of feeding stuffs for domestic animals, the penalties imposed under Section 20 of this Act shall apply.

SEC. 2. Be it enacted, That the examinations of specimens of foods and drugs shall be made by the State Chemist of Georgia, or under his direction and supervision, for the purpose of determining from such examination whether such articles are adulterated or misbranded within the meaning of this Act; and if it shall appear from any such examination that any of such specimens is adulterated or misbranded within the meaning of this Act, the Commissioner of Agriculture shall cause notice thereof to be given to the party from whom such sample was obtained. Any party so notified shall he given an opportunity to be heard before the Commissioner of Agriculture and the Attorney-General, under such rules and regulations as may be prescribed by them, and if it appears that any of the provisions of this Act have been violated by such party, then the Commissioner of Agriculture shall at once certify the facts to the proper prosecuting attorney, with a copy of the results of the analysis, or the examination of such article duly authenticated by the analyst or officer making such examination, under the oath of such officer. That in case it shall appear to the satisfaction of the Commissioner of Agriculture and the Attorney-General that the violation of this Act is properly a subject of interstate commerce, or otherwise comes under the supervision and jurisdiction of the United States, then the Commissioner of Agriculture shall certify the case to the United States District Attorney, in whose district the violation may have been committed; but if it be under the jurisdiction of the courts of this State, then the Commissioner shall certify the case to the solicitor of the court in the county where the offence occurred. It shall be the duty of the State solicitor to prosecute all persons violating any of the provisions of this Act as soon as he receives the evidence transmitted by the Commissioner of Agriculture. After judgment of the court, notice shall be given by publication in such manner as may be prescribed by the rules and regulations aforesaid.

SEC. 3. Be it enacted, That the term "drug," as used in the Act, shall include all medicines and preparations recognized in the United States Pharmacopœia, or National Formulary, for internal or

external use, and any substance or mixture of substances intended to be used for the cure, mitigation, or prevention of disease of either man or other animals. The term "food," as used herein shall include all articles used for food, drink, confectionery or condiment by man or other animals, whether simple, mixed or compound.

SEC. 4. Be it enacted, That for the purposes of this Act an article shall be deemed to be adulterated—

In case of drugs:—

First.—If, when a drug is sold under or by a name resognized in the United States Pharmacopœia or National Formulary, it differs from the standard of strength, quality or purity, as determined by the test laid down in the United States Pharmacopœia or National Formulary official at the time of investigation; *provided*, that no drug defined in the United States Pharmacopœia or National Formulary shall be deemed to be adulterated under this provision if the standard of strength, quality, or purity be plainly stated upon the bottle, box, or other container thereof, although the standard may differ from that determined by the test laid down in the United States Pharmacopœia or National Formulary.

Second. If its strength or purity fall below the professed standard or quality under which it is sold.

In the case of confectionery:

If it contains terra-alba, barytes, talc, chrome yellow, or other mineral substance or poisonous color or flavor, or other ingredient deleterious or detrimental to health, or any vinous, malt or spirituous liquor, or compound or narcotic drug.

In the case of food:

First. If any substance has been mixed and packed with it so as to reduce or lower or injuriously affect its quality or strength.

Second. If any substance has been substituted wholly or in part for the article.

Third. If any valuable constituent of the article has been wholly or in part abstracted.

Fourth. If it be mixed, colored, powdered, coated, or stained in a manner whereby damage or inferiority is concealed.

Fifth. If it contain any added poisonous or other added deleterious ingredient which may render such article injurious to health; *provided*, that when in preparation of food products for shipment they are preserved by any external application applied in such man-

ner that the preservative is necessarily removed mechanically, or by maceration in water, or otherwise. And directions for the removal of said preservative shall be printed on the covering or the package, the provisions of this Act shall be construed as applying only when said products are ready for consumption.

Sixth. If the package, vessel or bottle containing it shall be of such a composition, or carry any attachment made of such a composition of metal or alloy, as will be acted upon in the ordinary course of use by the contents of the package, vessel or bottle in such a way as to produce an injurious, deleterious or poisonous compound.

Seventh. If it consist in whole or in part of a filthy, decomposed, or putrid animal or vegetable substance, or any portion of an animal unfit for food, whether manufactured or not, or if it is the product of a diseased animal, or one that has died otherwise than by slaughter.

SEC. 5. Be it enacted, That the term "misbranded," as used herein, shall apply to all drugs, or articles of food, or articles which enter into the composition of food, the package or label of which shall bear any statement, design, or device regarding such articles, or the ingredients or substances contained therein which shall be false or misleading in any particular, and to any food or drug product, which is falsely branded, as to the State, Territory, or country in which it is manufactured or produced.

That for the purposes of this Act an article shall also be deemed to be misbranded—

In case of drugs:

First, if it be an imitation of, or offered for sale under the name of another article.

Second. If the contents of the package as originally put up shall have been removed, in whole or in part, and other contents shall have been placed in such package, or if the package fail to bear a statement on the label in as conspicuous letters as is or may be prescribed by the United States law or rules and regulations of the quantity or proportion of any alcohol, morphine, opium, cocaine, heroin, alpha or beta eucaine, chloroform, cannabis indica, chloral hydrate, or acetanilide, or any derivative or preparation of any such substances contained therein; *provided*, that nothing in this paragraph shall be construed to apply to the filling of written prescrip-

tions, furnished by regular licensed practicing physicians, and kept on file by druggists as required by law, or as to such preparations as are specified and recognized by the United States Pharmacopœia or National Formulary which are in accordance therewith.

In case of food:

First. If it be an imitation of, or offered for sale under the distinctive name of another article.

Second. If it be labeled or branded so as to deceive or mislead the purchaser, or purport to be a foreign product when not so, or is an imitation in package or label of another substance of a previously established name, or which has been trade-marked or patented, or, if the contents of the package as originally put up shall have been removed in whole or in part, and other contents shall have been placed in such package, or, if it fail to bear a statement on the label in conspicuous letters of the quantity or proportion of any morphine, opium, cocaine, heroin, alpha or beta eucaine, chloroform, cannabis indica, chloral hydrate, or acetanilide, or any derivative or preparation of any of such substances contained therein.

Third. If in package form, and the contents are stated in terms of weight or measure, they are not plainly and correctly stated on the outside of the package.

Fourth. If the package containing it, or its label shall bear any statement, design, or device regarding the ingredients of the substances contained therein, which statement, design, or device shall be false or misleading in any particular; *provided*, that an article of food which does not contain any added poisonous or deleterious ingredients shall not be deemed to be adulterated or misbranded in the following cases:

First. In the case of mixture or compounds which may be now, or from time to time, hereafter known as articles of food, under their own distinctive names, and not an imitation of or offered for sale under the distinctive name of another article, if the name be accompanied on the same label or brand with a statement of the place where said article has been manufactured or produced.

Second. In the case of articles labeled, branded, or tagged, so as to plainly indicate that they are compounds, imitations, or blends, and the word "compound," "imitation," or "blend," as the case may be, is plainly stated in conspicuous letters on the package in which it is offered for sale; *provided*, that the term "blend," as used

herein shall be construed to mean a mixture of like substances, not excluding harmless coloring or flavoring ingredients used for the purpose of coloring and flavoring only; and *provided, further*, that nothing in this Act shall be construed as requiring or compelling proprietors or manufacturers of proprietary foods which contain no unwholesome added ingredient to disclose their trade formulas, except in so far as the provisions of this Act may require to secure freedom from adulteration or misbranding; *provided, also*, that this Act shall not apply to stocks of drugs and medicines on hand in this State, until the first day of August, 1908.

SEC. 6. Be it enacted, That no dealer shall be prosecuted under the provisions of this Act when he can establish a guaranty signed by the wholesaler, jobber, manufacturer, or other party residing in the State of Georgia, from whom he purchases such articles, to the effect that the same is not adulterated or misbranded within the meaning of this Act, designating it. Said guaranty, to afford protection, shall contain the name and address of the party or parties making the sale of such articles to such dealer, and in such case the said party or parties shall be amenable to the prosecutions, fines, and other penalties which would attach, in due course, to the dealer under the provisions of this Act.

SEC. 7. Be it enacted, That any article of food, drug, or liquor that is adulterated or misbranded within the meaning of this Act, shall be liable to be proceeded against in any court of the State of Georgia within the county where the same is found, and seized for confiscation by a process of libel for condemnation. And if such article is condemned as being adulterated or misbranded, or of a poisonous or deleterious character, within the meaning of this Act, the same shall be disposed of by destruction or sale, as the said court may direct, and the proceeds thereof, if sold, less the legal costs and charges, shall be paid into the treasury of the State of Georgia, but such goods shall not be sold in any jurisdiction contrary to the provisions of this Act, or the laws of that jurisdiction.

SEC. 8. Be it enacted, That the words "person" or "party," as used in this Act, shall be construed to import both the plural and the singular, as the case demands, and shall include corporations, companies, societies and associations.

When construing and enforcing the provisions of this Act, the act, omission or failure of any officer, agent or other person acting for or

employed by the corporation, company, society or association, within the scope of his employment or office, shall in every case be also deemed to be the act, omission or failure of such corporation, company, society or association, as well as that of the person.

SEC. 9. Be it enacted, That the State Department of Agriculture is hereby charged with the duties of inspection and analysis required for the proper enforcement of this Act. That the Commissioner of Agriculture is hereby directed to appoint officers, who shall perform all the duties required in the execution of this Act. That the Commissioner, realizing the responsibilities resting on him for the protection of the lives and health of the people, shall, in making these appointments, be guided by the results of careful and diligent inquiry into the character, fitness and reputation for integrity and industry of all the officers whom he may appoint, who may be in any way intrusted with the execution of this law; that such officers, when appointed, shall hold office during good behavior and attention to duty, and shall not be removed from office except for cause, provided such term of office of said officers shall terminate with that of the office of Commissioner of Agriculture.

SEC. 10. Be it further enacted, That as soon as this Act becomes effective the Commissioner is authorized to appoint by and with the advice and consent of the State Chemist, a chief food and drug inspector for the State of Georgia, who shall receive a salary not to exceed $1,500 per annum, and actual expenses while discharging his duty. His whole time shall be at the disposal of the Commissioner, and his duty shall be to travel about the State as directed, and take samples of such articles as directed, and forward them to the Department of Agriculture for scientific examination and analysis. The State Chemist may also appoint by and with the advice and consent of the Commissioner of Agriculture such additional assistants and experts, not to exceed three, in his office as may be required to carry out the provisions of this Act; the salaries of such assistants and experts to be fixed and adjusted by the Commissioner of Agriculture and the State Chemist, not to exceed $1,500. They may also make such expenditures for apparatus, chemicals and increased laboratory facilities as in their judgment may be required, provided that the total expenditures under this Act for any one year shall not exceed the sum appropriated to carry out the provisions of this Act.

SEC. 11. Be it enacted, That samples for analysis shall be taken by the duly qualified and sworn inspectors, who shall take samples of such articles as may be directed by the Commissioner of Agriculture, and in the manner prescribed below; whenever practicable, samples shall be taken in original unbroken packages; said package shall be wrapped in paper and tied securely, and sealed over the cord with sealing-wax, on which the inspector shall impress his official seal. That in cases where it is not practicable to send a sample for analysis in an original package, as, for instance, in case of syrups, or other liquids in barrels, or flour in barrels, etc., the inspector shall take a fair sample of the same in the presence of the seller, place it in a suitable receptable, securely close and wax it and impress his official seal upon the wax and forward the same to the Commissioner of Agriculture. In the execution of his duties the inspector shall have free access at all reasonable hours into any place where it is suspected that impure foods are being manufactured, or wherein any article of food or drink, drug or medicine, adulterated with any deleterious or foreign ingredients exists. In calling for and taking a sample of any goods, the inspector shall tender to the seller the market price asked for the same.

SEC. 23. Be it enacted, That the Commissioner of Agriculture, with the advice of the Attorney-General, shall have authority to establish such rules and regulations as shall not be inconsistent with the provisions of this Act, and as in his judgment will best carry out the requirements thereof. He may exercise discretion as to the class of products he first subjects to rigorous inspection and analysis, realizing that the fullest and most complete execution of this law under a limited appropriation must be a matter of growth. His first efforts shall be more particularly directed to fostering the young and growing agricultural and manufacturing industries of the State, as the dairy, beef, fruit, cotton-seed oil and syrup industries, by suppressing adulteration in butter, cheese, milk, feed-stuffs, ciders, vinegars and syrups, lard and lard compounds.

SEC. 24. Be it further enacted, That in order to enforce and carry out the provisions of this Act the sum of ten thousand dollars, or so much thereof as may be necessary, is hereby appropriated and set aside out of the fees arising from the inspection and analysis of fertilizers, and so much as is necessary is made immediately available That the proceeds arising from the fees of this office be turned into the treasury for the use of the common school fund of the State.

SEC. 25. Be it enacted, That this Act shall be in force and effect from and after the first day of August, 1907.

SEC. 26. Be it further enacted, That all laws and parts of laws in conflict with this Act be, and the same are, hereby repealed.

AMENDMENT TO THE PURE FOOD AND DRUG LAW OF VERMONT.[1]

The following amendment was approved December 10, 1906:

AN ACT in Amendment of and in Addition to No. 148 of the Acts of 1904, entitled "An Act Providing for the Inspection of Food, Drugs and other articles in common use."

It is hereby enacted by the General Assembly of the State of Vermont:

SECTION 1. Section 2 of No. 143 of the acts of 1904, is hereby amended so as to read as follows, viz.:

SEC. 2. The term "drug" as used in this act shall include all medicines and preparations recognized in the United States Pharmacopœia or National Formulary for internal or external use, and any substance or mixture of substances intended to be used for the cure, mitigation or prevention of disease of either man or beast. The term "food" as used herein shall include all articles, whether simple, mixed or compound, used for food, drink, confectionery, or condiments by man or beast.

SEC. 2. Section 3 of No. 143 of the acts of 1904 is hereby amended so as to read as follows, viz.:

SEC. 3. For the purposes of this act an article shall be deemed to be adulterated:

In cases of drugs:

First. If, when a drug is sold under or by a name recognized in the United States Pharmacopœia or National Formulary, it differs from the standard of strength, quality or purity, as determined by the test laid down in the United States Pharmacopœia or National Formulary official at the time of investigation, provided that no drug defined in the United States Pharmacopœia or National Formulary shall be deemed to be adulterated under this provision

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[1] We are indebted to Mr. J. H. Redsecker, of Lebanon, Pa., for furnishing a copy of this law.—EDITOR.

if the standard of strength, quality or purity be plainly stated upon the bottle, box or other container thereof, although the standard may differ from that determined by the test laid down in the United States Pharmacopœia or National Formulary.

Second. If its strength or purity falls below the professed standard or quality under which it is sold.

In the case of confectionery:

If it contains terra alba, barytes, talc, chrome yellow, or other mineral substance or poisonous color or flavor, or other ingredient deleterious or detrimental to health, or any vinous, malt or spirituous liquor or compound or narcotic drugs.

In the case of food:

First. If any substance has been mixed and packed with it so as to reduce or lower or injuriously affect its quality or strength.

Second. If any substance has been substituted wholly or in part for the article.

Third. If any valuable constituent of the article has been wholly or in part abstracted.

Fourth. If it be mixed, colored, powdered, coated or stained in a manner whereby damage or inferiority is concealed.

Fifth. If it contains any added poisonous or other added deleterious ingredient which may render such article injurious to health; provided, that when in the preparation of food products for shipment they are preserved by any external application applied in such manner that the preservative is necessarily removed mechanically, or by maceration in water or otherwise, and directions for the removal of said preservative shall be printed on the covering of the package, the provisions of this act shall be construed as applying only when said products are ready for consumption.

Sixth. If it consists in whole or in part of a filthy, decomposed or putrid animal or vegetable substance, or any portion of an animal unfit for food, whether manufactured or not, or if it is the product of a diseased animal, or one that has died otherwise than by slaughter.

SEC. 3. No. 143 of the acts of 1904, is hereby amended by adding a new section to be numbered section 4, which shall read as follows, viz.:

SEC. 4. The term "misbranded," as used herein, shall apply to all drugs, or articles of food, or articles which enter into the com-

position of food, the package or label of which shall bear any statement, design or device regarding such article, or the ingredients or substances contained therein which shall be false or misleading in any particular, and to any food or drug product which is falsely branded as to the State, Territory or country in which it is manufactured or produced.

For the purposes of this act an article shall also be deemed to be misbranded.

In case of drugs:

First. If it be an imitation of or offered for sale under the name of another article.

Second. If the contents of the package as originally put up shall have been removed, in whole or in part, and other contents shall have been placed in such package, or if the package fail to bear a statement on the label of the quantity or proportion of any alcohol, morphine, opium, cocaine, heroin, alpha or beta eucaine, chloroform, cannabis indica, chloral hydrate or acetanilide, or any derivative or preparation of any such substances contained therein.

In the case of food:

First. If it be an imitation of or offered for sale under the distinctive name of another article.

Second. If it be labeled or branded so as to deceive or mislead the purchaser, or purport to be a foreign product when not so, or if the contents of the package as originally put up shall have been removed in whole or in part and other contents shall have been placed in such package, or if it fail to bear a statement on the label of the quantity or proportion of any morphine, opium, cocaine, heroin, alpha or beta eucaine, chloroform, cannabis indica, chloral hydrate or acetanilide, or any derivative or preparation of any substances contained therein.

Third. If in package form, and the contents are stated in terms of weight and measure, they are not plainly and correctly stated on the outside of the package.

Fourth. If the package containing it or its label shall bear any statement, design or device regarding the ingredients or the substances contained therein, which statement, design or device shall be false or misleading in any particular; provided that an article of food which does not contain any added poisonous or deleterious ingredients shall not be deemed to be adulterated or misbranded in the following cases:

First. In the case of mixtures or compounds which may be now or from time to time hereafter known as articles of food, under their own distinctive names, and not an imitation of or offered for sale under the distinctive name of another article, if the name be accompanied on the same label or brand with a statement of the place where said article had been manufactured or produced.

Second. In the case of articles labeled, branded or tagged so as to plainly indicate that they are compounds, imitations or blend, and the word "compound," "imitation," or "blend," as the case may be, is plainly stated on the package in which it is offered for sale; provided that the term "blend" as used herein shall be construed to mean a mixture of like substances, not excluding harmless coloring or flavoring ingredients used for the purpose of coloring and flavoring only; and provided further, that nothing in this act shall be construed as requiring or compelling proprietors or manufacturers of proprietary foods which contain no unwholesome added ingredients to disclose their trade formulas, except in so far as the provisions of this act may require to secure freedom from adulteration or misbranding.

SEC. 4. Section 13 of No. 143 of the acts of 1904, is hereby amended so as to read as follows, viz.:

SEC. 13. An apothecary, druggist or other person who sells arsenic, corrosive sublimate, nux vomica, chloroform, strychnine, morphine, opium, cocaine, carbolic acid or prussic acid, or its salts, shall, at the time of such sale, make a record of such sale in a book kept for that purpose, specifying the kind and quantity of the article sold, and the time when and the name of the person to whom such sale is made, which record shall be open to health officers, members of the State Board of Health and State officials who may wish to examine the same.

SEC. 5. Section 20 of No. 143 of the acts of 1904, is hereby amended so as to read as follows, viz.:

SEC. 20. Justices shall have concurrent jurisdiction with the county court of offences under this act to the extent of fining the respondent fifty dollars, or may bind him over for trial by county court. It shall be the duty of the State's attorney to whom the State Board of Health shall report a violation of this act to cause proceedings to be commenced and prosecuted in the proper court without delay, for the enforcement of the penalties as in such case herein provided.

DRAFT OF A PROPOSED DRUG LAW FOR THE STATE OF PENNSYLVANIA.[1]

AN ACT for preventing the manufacture or sale of adulterated or misbranded drugs.

Be it enacted—

SECTION 1. That it shall be unlawful for any person to manufacture or sell or offer for sale any drug which is adulterated or misbranded, within the meaning of this Act, and any person who shall violate any of the provisions of this section shall be guilty of a misdemeanor, and for each offence shall, upon conviction thereof, be fined not to exceed fifty dollars, and for each subsequent offence and conviction thereof shall be fined not to exceed one hundred dollars.

SEC. 2. That the term "drug" as used in this Act shall include all medicines and preparations recognized in the United States Pharmacopœia, the National Formulary or the American Homeopathic Pharmacopœia for internal or external use, and any substance or mixture of substances intended to be used for the cure, mitigation, or prevention of disease of either men or other animals.

SEC. 3. That for the purpose of this Act an article shall be deemed to be adulterated

First. If, when a drug is sold under or by any name recognized by the United States Pharmacopœia, the National Formulary or the American Homeopathic Pharmacopœia, it differs from the standard of strength, quality, or purity, as determined by the tests laid down in the United States Pharmacopœia, the National Formulary or the American Homeopathic Pharmacopœia: *Provided*, That no drugs defined in the United States Pharmacopœia, the National Formulary or the American Homeopathic Pharmacopœia shall be deemed to be adulterated under this provision if the standard of strength, quality, or purity be plainly stated upon the bottle, box, or other container thereof, although the standard may differ from that determined by the test laid down by the United States Pharmacopœia, the National Formulary or the American Homeopathic Pharmacopœia.

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[1] This draft was prepared by George A. Gorgas and further elaborated at a meeting of the committee appointed by the chairman of the joint conferences held at the Philadelphia College of Pharmacy, January 15. The editor is indebted to Mr. Mahlon N. Kline for supplying him with a copy.

Second. If its strength or purity fall below the professed standard or quality under which it is sold.

SEC. 4. That for the purposes of this Act an article shall be deemed to be misbranded:—

First. All drugs, the package or label of which shall bear any statement, design, or device regarding such article, or the ingredients or substance or substances contained therein shall be false or misleading in any particular.

Second. If it be an imitation of or offered for sale under the name of another article.

Third. If the contents of the package as originally put up shall have been removed, in whole or in part, and other contents shall have been placed in such package, or if the package fail to bear a statement on the label of the true formula of the contained mixture or of the presence of any alcohol, morphine, opium, cocaine, heroin, alpha or beta eucaine, chloroform, cannabis indica, chloral hydrate, acetanilide, acetphenetidine or phenacetine, antipyrine, or any derivative or any preparation of any such substances contained therein. *Provided*, that nothing in this paragraph shall be construed to apply to the filling of written prescriptions, furnished by practicing physicians, dentists and veterinarians and kept on file by druggists, or as to such preparations as are specified and recognized by the United States Pharmacopœia, the National Formulary or the American Homeopathic Pharmacopœia which are made in accordance therewith, and sold under titles designated therein.

Fourth. That the enforcement of this law shall be entrusted to a Commission consisting of the Commissioner of Health, the Attorney General and three (pharmaceutical) members selected by the Governor of the State from the members of the State Pharmaceutical Examining Board; this Commission shall make uniform rules and regulations for carrying out the provision of this Act, including the collection and examination of specimens of drugs manufactured or offered for sale in the State.

Fifth. That the examinations of specimens of drugs shall be made under the direction and supervision of said Commissioners, for the purpose of determining from such examinations whether such articles are adulterated or misbranded within the meaning of this Act; and if it shall appear from any such examination that any of such specimens are adulterated or misbranded within the meaning

of this Act, the Commissioners shall cause notice thereof to be given to the party from whom such sample was obtained. Any party so notified shall be given an opportunity to be heard, under such rules and regulations as may be prescribed as aforesaid, and if it appears that any of the provisions of this Act have been violated by such party, then the Commissioners shall at once certify the facts to the proper District Attorney with a copy of the results of the analysis of the examination of such article duly authenticated by the analyst or officer making such examination, under the oath of such officer. After judgment of the Court, notice shall be given by publication in such manner as may be prescribed by the rules and regulations aforesaid.

Sixth. That it shall be the duty of each District Attorney to whom the Commissioners shall report any violation of this Act, to cause appropriate proceedings to be commenced and prosecuted in the proper courts, without delay, for the enforcement of the penalties as in such case herein provided.

Seventh. That no dealer shall be prosecuted under the provisions of this Act when he can establish a guaranty signed by the wholesaler, jobber, manufacturer, or other party from whom he purchases such articles, to the effect that the same is not adulterated or misbranded within the meaning of this Act. Said guaranty, to afford protection, shall contain the name and address of the party or parties making the sale of such articles to such dealer, and in such case said party or parties shall be amenable to the prosecutions, fines, and other penalties which would attach, in due course, to the dealer under the provisions of this Act.

Eighth. That this Act shall not apply to such remedies which may be in the possession of a dealer at the time this law becomes effective.

Ninth. That this Act shall be in force and effect from and after the first day of March, nineteen hundred and eight.

DISCUSSION OF A PURE FOOD AND DRUG LAW FOR THE STATE OF PENNSYLVANIA.

PHARMACEUTICAL MEETING.

The fourth of the series of Pharmaceutical Meetings for 1906–1907 was held in the Museum of the Philadelphia College of Phar-

macy on Tuesday evening, January 15th, and, as previously announced, was devoted to a joint conference of members and committees from local organizations interested in the enactment of a State Pure Food and Drug Law. Upwards of 150 persons, representing 15 local organizations, were present. On motion of Prof. Jos. P. Remington, Mr. Wm. L. Cliffe, the Treasurer of the State Pharmaceutical Examining Board, was requested to preside.

Mr. Cliffe, in introducing the subject matter for discussion, said:—

This meeting is distinctive in that it is an assemblage of representative pharmacists of the State as well as representatives of various medical bodies, called together for the purpose of considering the details of a bill suitable for presentation to the legislature for the purpose of harmonizing the present law with the Federal Pure Food and Drugs Act of June 30, 1906.

It is known to many of us here this evening that a number of bills have been prepared or are in course of preparation for this purpose, and in consideration of this the Committee of the Local Branch of the American Pharmaceutical Association, to whom the matter was referred at the December meeting, have tried to cover the situation by calling this meeting.

There is no doubt that the best results from every point of view are to be obtained in a matter of this kind from deliberate consideration of the various propositions by a body such as this, possessing the technical grasp of the practical details and a sincere desire to deal fairly with the public and themselves.

It is also of interest to note that a number of those outside the professions mentioned, who have been active in advocating and promoting legislation of this character, have accepted this view of the usefulness of this body and are looking for the results of your deliberations, and have deferred precipitate action on this account. For the purpose of facilitating the work before us the Secretary of the Committee, Mr. Wilbert, has prepared a preamble and resolutions that will be properly placed before you for amendment, rejection or adoption as expressed by your votes after thorough discussion.

He further called attention to the apparent need of revising the existing State laws on foods and drugs and then read the following extract from the inaugural speech of Governor Stuart of Pennsylvania, which had just been published in the afternoon papers:—

No appeal to the lawmaking power for relief should commend itself with greater favor than that for the prohibition of the sale of adulterated food, drugs and beverages. No more serious obligation can be imposed upon public officials than devolves upon those who are entrusted with the protection of the public health by a strict enforcement of the pure food laws. An innocent violator of the law should not be made a scapegoat for the real culprit.

I therefore recommend to the careful consideration of the Legislature the

advisability of such changes as will make the law protect both the people who are the consumers, and who might be imposed upon, and the retailer who unknowingly violates the law by selling the adulterated articles.

I also suggest the advisability of making all pure food legislation conform as nearly as possible to the Federal laws upon the same subject.

Following the reading of this extract, Mr. Cliffe referred to it as additional evidence of the desirability, or the evident need for conservative and rational legislation along the very lines for which the conference had been called.

Mr. Wilbert then read the preamble and set of resolutions that had been prepared by the Committee of the Philadelphia Branch of the American Pharmaceutical Association, which was followed by an animated discussion, lasting for upwards of three hours, resulting finally in the practically unanimous endorsement of the preamble and all of the essential features of the resolutions as originally presented.

Communications received from pharmacists in the western portion of the State indicated that they were prepared to plead for the practical enforcement of the existing law, popularly known as "the act of 1897." In this plea they were joined by a number of pharmacists from the eastern section, particularly from Philadelphia, until it was shown that this act was in many respects inadequate to protect either the public or the retail pharmacist, and was practically impossible to live up to in the provisions that it did contain. While it is true that this act was among the first to recognize "The latest edition of the 'National Formulary' or the 'Pharmacopœia of the United States' regarding quality or impurity," it was also pointed out that if rigidly enforced it would effectually prevent progress or necessary changes in connection with any of the medicaments that were included in the several books enumerated. It was further shown that despite the fact that this law had been in force for nearly ten years, and was being either willfully or innocently disobeyed by practically every pharmacist in the State, but two prosecutions had been made in all that time.

In summing up the reasons why the law of 1897 should be superseded by a new one embodying the fundamental principles of the Pure Food and Drugs Law, Mr. Mahlon N. Kline spoke as follows:

The fundamental principles underlying the Federal Pure Food and Drugs Act are two. First, that every article sold as a medicine and labeled U.S.P. or N.F. shall conform to the standard laid down in these authorities, and that every article differing from the U.S.P. or N.F. standards shall still be permitted

to be sold, provided it carries on its own label its professed standard, and is of a quality conforming thereto.

The second is, that any statement made with regard to any article that is sold as a medicine for man or other animal shall be a true statement, or, in the language of the law, shall "not be misleading."

Both these underlying principles can be still more briefly expressed by the words "common honesty," or, applying honest methods in the manufacture and sale of medicines, and providing penalties for those who violate such methods.

The trouble with the law of 1897 is that its provisions are so drastic and inelastic and so limited in its application, that it never has been and never will be enforced. It is not only lack of money and the proper officer to enforce it that is to be held responsible for this, but because everybody feels that, literally construed, there is no one, not even the members of the Board of Pharmacy, who literally does or can carry out its provisions.

U.S.P. and N.F. articles alone are controlled by its provisions, and a drug is defined to be adulterated when it does not come up to the U.S.P. or N.F. standard. Now, as practical experience has demonstrated that at least some U.S.P. standards are faulty and need correction, and cannot fully be carried out in the manufacture of pharmaceutical preparations, it is no wonder that it has been a dead law on our statute books, and it is no wonder that those who study the situation favor its abolition, and a proposition more in line with that which is practicable should take its place.

While they are, perhaps, not conscious of it, those who advocate our remaining under the law of 1897 for a few more years are, in fact, advocating that we do nothing to improve the condition, under which pharmacists are laboring, within the State for several more years. The condition is, that honest pharmacists are in terror because perhaps an impracticable law may be enforced, and are struggling against competition in the sale of preparations made by unscrupulous competitors, who do not fear the law because they feel it will never be enforced.

After some additional discussion, relating largely to minor details, or to the rules and regulations that have been promulgated by the persons charged with the enforcement of the Federal law, the following preamble and set of resolutions were adopted as being the sense of the meeting, and referred to a committee consisting of one member from each of the organizations represented at the conference:—

RESOLUTIONS FAVORING THE ENACTMENT OF A STATE FOOD AND DRUG LAW.

WHEREAS the manufacture or the sale of impure or adulterated foods, drugs, medicines and liquors is fraught with harm to the community and is inimical to the public health, and,

WHEREAS the Senate and the House of Representatives of the United States of America, in Congress assembled, have enacted a law "For preventing the manufacture, sale or transportation of adulterated or misbranded or

poisonous or deleterious foods, drugs, medicines and liquors, and for regulating traffic therein, and for other purposes;" and,

WHEREAS, to obviate unnecessary complications and to facilitate the enforcement of the Federal law, officially designated as "The Food and Drugs Act, June 30, 1906," it is desirable that the fundamental principles that are involved be adopted and endorsed by the individual States. Now, therefore,

Be it Resolved that we, representatives and members of medical and pharmaceutical associations in the State of Pennsylvania, in meeting assembled, recognize the value and the importance of rational laws to govern the sale of foods and drugs and to prevent their adulteration and harmful sophistication.

Be it further Resolved that we endorse the fundamental principles of the Federal Pure Food and Drug Law, and that we recommend the enactment of a measure by the Legislature of the State of Pennsylvania similar to that law with the exceptions named in the next following resolution.

Be it further Resolved that we recommend that such a State law be devoid of all unnecessary and vexatious restrictions and that the preparations of the United States Pharmacopœia and of the National Formulary, when sold for medicinal use, and the written prescriptions of duly licensed physicians when dispensed and kept on file by a regular licensed pharmacist, be exempt from the provisions of the clause requiring specific labels.

Be it further Resolved that we recommend that when enacted the enforcement of such a law should be placed in the hands of the State Pharmaceutical Examining Board, and that they be authorized to employ competent investigators, and that a suitable appropriation be made for the enforcement of the law.

The chairman subsequently announced the following names as members of the committee to further consider the resolutions and to outline a suitable pure drug law with the necessary provisions for its enforcement:—

Medical Society of the State of Pennsylvania, Dr. Henry Beates, Jr.

Philadelphia County Medical Society, Dr. Henry Leffmann.

Medical Jurisprudence Society, Dr. Henry W. Cattell.

Pennsylvania State Pharmaceutical Association, John C. Wallace.

Western Pennsylvania Retail Druggists Association, Louis Emanuel.

Philadelphia Association of Retail Druggists, Charles Rehfuss.

Dauphin County Association of Retail Druggists, George C. Gorgas.

Lancaster County Association of Retail Druggists, W. O. Frailey.

Montgomery County Association of Retail Druggists, Walter Rothwell.

Philadelphia Drug Exchange, Mahlon N. Kline.

Philadelphia Wholesale Drug Co., E. R. Gatchell.

Philadelphia College of Pharmacy, Joseph P. Remington.

Philadelphia Branch of the American Pharmaceutical Association, Joseph W. England.

Public Health Defence League, M. I. Wilbert.

Member ex officio, William L. Cliffe.

M. I. WILBERT,
Secretary pro tem.

BOOK REVIEW.

A TEXT-BOOK OF MATERIA MEDICA, THERAPEUTICS, AND PHARMACOLOGY. By George F. Butler, Ph.G., M.D., Associate Professor of Therapeutics in the College of Physicians and Surgeons, Chicago. Fifth edition, thoroughly revised by Smith Ely Jelliffe, M.D., Ph.D., Professor of Pharmacognosy and Instructor in Materia Medica and Therapeutics in Columbia University (College of Physicians and Surgeons), New York. Illustrated. Philadelphia and London: W. B. Saunders Company, 1906.

Butler's Materia Medica has been well received for years and has been favorably reviewed before in this JOURNAL. The present revision is the work of Dr. Jelliffe, who has attempted to bring the book into accord with the new (1905) Pharmacopœia, and the practical results of the newer pharmacology. While it is claimed that the book has been brought into accord with the requirements of the new U.S.P., we notice one instance where the new standards are not given. In calx chlorinata it is stated that the available chlorine is 35 per cent. when it should be 30 per cent. In taking the definitions of the new U.S.P. it might have have been well to have included all of the definition, as under solution of hydrogen dioxide, where the statement as given in the U.S.P. that "it should be kept in a cool place" is omitted. In quoting pharmacopœial definitions the family name is uniformly omitted. Some of the official substances are also apparently omitted, as chrysarobinum, matico and scutellaria. It is a question whether this book would not be of greater value to the student if the pharmacopœial text were entirely omitted and the student were expected to consult that book for his information of pharmacopœial substances. "The arrangement of drugs has been so changed that those drugs whose predominant action is in one system of organs of the body are grouped together, thus suggesting

their therapeutic as well as their pharmacological alliances." In this part are retained the valuable features of the earlier editions; some matter has been expunged and the newer matter included.

PHILADELPHIA COLLEGE OF PHARMACY.

The quarterly meeting of the members of the Philadelphia College of Pharmacy was held December 31st, at 4 o'clock, in the Library. The president, Howard B. French, presided.

Thirteen members were present. The minutes of the semi-annual meeting, held September 24th, were read and approved. The minutes of the Board of Trustees for the meetings held September 11th, October 2d, and November 7th, were read by the registrar, and approved.

Mr. Wilbert stated that at the coming session of the Legislature of Pennsylvania there would probably be introduced measures affecting the interests of pharmacy, and suggested the appointment of a new committee to be called the Committee on Legislation, to take cognizance of all new legislation, and to act in conjunction with Committees of allied bodies for the same purpose. This was agreed to, and the president appointed the following named gentlemen, Mahlon N. Kline, chairman; Joseph P. Remington, M. I. Wilbert, William McIntyre, Warren H. Poley.

Mr. Boring alluded to the death of William B. Thompson, a member of the college since 1862, and for many years a member of the Board of the Trustees and secretary of the college, and suggested that a suitable minute be prepared, which was agreed to, and referred to the Committee on Necrology.

Mr. McIntyre alluded to the recent death of Albert E. Ebert, of Chicago, long identified with pharmacy, and said that it was proposed to erect a monument to his memory, and that he would receive any contributions for that purpose.

ABSTRACT FROM THE MINUTES OF THE BOARD OF TRUSTEES OF THE PHILADELPHIA COLLEGE OF PHARMACY.

September 11, 1906. The Committee on Property reported that the ceiling and walls in the Microscopical Laboratory and some of the lecture rooms were being painted and put in order, that all other necessary repairs to the building had been completed, and

that the property was in good condition. Committee on Library reported the addition of a large number of volumes. Committee on Instruction submitted an amendment to Article 8, Section 2, of the By Laws, relating to matriculation, which, after being read, was laid over for consideration at the next meeting. Committee on Examination reported that Raymond D. Black, Powell Hampton, George W. Lord, Jr., and Waldo J. Williams had successfully passed the examination for the certificate of Proficiency in Chemistry, and that Finley Page Seibert had successfully passed his examination for the Degree of Doctor in Pharmacy; all of whom were duly elected by the Board. Committee on Membership. Upon a favorable report being submitted, Dr. Alfred Heineberg, Edwin L. Newcomb, C. Robert Weiser, and Manuel Fernandez were elected to active membership in the college.

October 2, 1906. Committee on Examination reported that the examinations of additional students were held on September 28 and 29, 1906. Committee on Instruction brought up for further action the proposed amendment to Article 8, Section 2, which was unanimously adopted.

November 7, 1906. Committee on Library reported the addition of a large number of volumes to the library. Committee on Instruction presented a report in reference to students unable to supply certificates or pass the entrance examination. Committee on Examination submitted a report upon additional students. Committee on Scholarships submitted the names of seven students to whom they recommended that scholarships should be awarded, which was agreed to by the Board. The Registrar read a communication from the Secretary of the Board of Public Education presenting the name of Mitchell Bernstein, a graduate of the Northeast Manual Training School, for a scholarship in the college, which was duly awarded.

C. A. WEIDEMANN,
Recording Secretary.

DECEMBER PHARMACEUTICAL MEETING.

The regular pharmaceutical meeting of the Philadelphia College of Pharmacy was held Tuesday evening, December 18th, with Prof. Joseph P. Remington in the chair.

The principal speaker of the evening was Harry B. Mason, of

Detroit, co-editor of the *Bulletin of Pharmacy*, who gave a timely and interesting address on the subject: "Four Things Every Druggist Should Know About His Business." This paper was published in full in the January issue of this JOURNAL, p. 10.

Henry C. Blair sent a paper on "A Special Form of Check for Paying Bills," which was read in the absence of the author by Edwin L. Newcomb, P.D., and published in the January issue of this JOURNAL, p. 21.

E. Fullerton Cook, P.D., read a paper on "A Simple System for Personal Accounts" which was illustrated by some models of apparatus that he had made. (See p. 36 of the January number.)

Clarence L. Bonta, P.D., read a paper having the title "The Retort Courteous." The paper was devoted to a consideration of the principles underlying successful advertising and was illustrated with a number of charts and specimens of advertisements.

These several papers were discussed by the following persons: A. J. Staudt, William L. Cliffe, Warren H. Poley, Thomas H. Potts, Charles H. Rehfuss, E. R. Gatchell, Henry Kraemer, M. I. Wilbert, C. B. Lowe, David Potts, and the chairman.

Mr. Staudt called attention to the double-page loose-leaf ledger used by F. P. Streeper of Chestnut Hill, Philadelphia, for rendering his monthly bills. He said:

"By inserting a carbon sheet under the folded page the ledger entry and bill that goes to the customer are made at one writing. It is preferable to use a manifolding fountain pen with a firm point, which are specially made for working carbon copies, or as Mr. Streeper uses the system his stenographer makes the entry each day on the typewriter, which makes a very neat bill to send to the customer. By posting the charge slips daily the customer's bill is always ready, or at the end of the month by simply tearing the top sheet off at the perforation the bills are at once ready to be mailed to the customer. After the bill which is sent to the customer is paid the remaining sheet is removed from the *live* ledger to a *dead* ledger and filed for reference purposes."

M. H. Webster and R. C. Pursel presented a paper on "The Estimation of Strychnine in Nux Vomica by the Nitric Acid Process." (See p. 1 of the January number.)

HENRY KRAEMER,
Secretary.